

**Amendments to the Claim :**

This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (currently amended)     A method of sequencing DNA fragments comprising:
  - placing a DNA sample within a buffer in a separation apparatus having a plurality of migration channels;
  - applying an electric field across the separation apparatus to create a bias in the buffer such that the DNA sample migrates from one end of the apparatus to another end along a migration channel;
  - separating the DNA sample into fragments along the migration channel within the buffer;
  - detecting fluorescent light emitted from the fragments along the migration channel using a full-width array scanner capable of scanning an entire width of the separation apparatus simultaneously; and,
  - generating a full image of the separation apparatus and the separated DNA fragments in a single scan pass.
2. (original)   The method of claim 1 wherein the buffer is a gel.
3. (original)   The method of claim 1 wherein the buffer is a polymer solution.
4. (previously presented)   The method of claim 1 wherein the separation apparatus comprises a plurality of capillary tubes forming the migration channels.
5. (previously presented)   The method of claim 1 wherein the separation apparatus comprises a set of glass plates with lithographically etched channels forming the migration channels.

6. (canceled)

7. (previously presented) A method of sequencing DNA fragments comprising:

placing a DNA sample within a buffer in a separation apparatus having a plurality of migration channels;

applying an electric field across the separation apparatus to create a bias in the buffer such that the DNA sample migrates from one end of the apparatus to another end along a migration channel;

separating the DNA sample into fragments along the migration channel within the buffer;

detecting fluorescent light emitted from the fragments along the migration channel using an amorphous silicon two-dimensional image sensor array and,

generating a full image of the separation apparatus and the separated DNA fragments.

8. (original) The method of claim 1 wherein the detecting comprises detecting at a first time and then repeating the detecting after DNA fragments migrate through the gel for an additional period of time.

9. (currently amended) An apparatus for the sequencing of DNA comprising:

a separation apparatus having a plurality of migration channels operative to receive a DNA sample and facilitate migration and separation into fragments of the DNA sample along a migration channel within the apparatus;

a detector operative to detect light emitted from DNA fragments along the migration channels wherein said detector comprises a full-width array scanner capable of scanning an entire width of the separation apparatus simultaneously; and

an image processor operative to generate image data representing a full image of the separation apparatus and the DNA fragments in a single scan pass.

10. (previously presented) The apparatus of claim 9 wherein the separation apparatus comprises:

a plurality of capillary tubes comprising the migration channels;  
a buffer; and,  
a means for providing an electric field to create a bias between ends of the capillary tubes.

11. (original) The apparatus of claim 9 wherein the separation apparatus comprises:

a stacked pair of lithographically etched glass plates;  
a buffer; and,  
a means for providing an electric field to create a bias between ends of the glass plates.

12. (canceled)

13. (previously presented) An apparatus for the sequencing of DNA comprising:

a separation apparatus having a plurality of migration channels operative to receive a DNA sample and facilitate migration and separation into fragments of the DNA sample along a migration channel within the apparatus;

a two-dimensional amorphous silicon image sensor array detector operative to detect light emitted from DNA fragments along the migration channels; and,

an image processor operative to generate image data representing a full image of the separation apparatus and the DNA fragments.

14. (canceled)

15. (currently amended) The system of claim 44 20 wherein the detecting means comprises a full-width array scanner.

16. (previously presented) A system for sequencing DNA fragments comprising:

means for placing a DNA sample within a buffer in a separation apparatus having a plurality of migration channels;

means for applying an electric field across the separation apparatus to create a bias in the buffer such that the DNA sample migrates from one end of the apparatus to another end along a migration channel;

means for separating the DNA sample into fragments along the migration channel within the buffer;

means for illuminating the DNA fragments;

an amorphous silicon two-dimensional image sensor array for detecting fluorescent light emitted from the illumination fragments along the migration channel; and,

means for generating a full image of the separation apparatus and the separated DNA fragments.

17. (currently amended) The system of claim 44 16 wherein the illumination means comprises a laser that illuminates perpendicular to the direction of migration of the DNA fragments.

18. (currently amended) The system of claim 44 16 wherein the illumination means comprises a laser that illuminates along the direction of migration of the DNA fragments.

19. (currently amended) The system of claim 44 16 wherein the illumination means comprises a light emitting diode bar.

20. (previously presented) A system for sequencing DNA fragments comprising:

means for placing a DNA sample within a buffer in a separation apparatus having a plurality of migration channels;

means for applying an electric field across the separation apparatus to create a bias in the buffer such that the DNA sample migrates from one end of the apparatus to another end along a migration channel;

means for separating the DNA sample into fragments along the migration channel within the buffer;

a laser attached to the rear of the detecting means for illuminating the DNA fragments;

means for detecting fluorescent light emitted from the illumination fragments along the migration channel; and,

means for generating a full image of the separation apparatus and the separated DNA fragments.

21. (previously presented) The method of claim 7 wherein the buffer is a gel.

22. (previously presented) The method of claim 7 wherein the buffer is a polymer solution.

23. (previously presented) The method of claim 7 wherein the separation apparatus comprises a plurality of capillary tubes forming the migration channels.

~~24. (previously presented) The method of claim 7~~  
wherein the separation apparatus comprises a set of glass plates with lithographically etched channels forming the migration channels.

25. (previously presented) The apparatus of claim 13 wherein the separation apparatus comprises:

- at least on capillary tube;
- a buffer; and,
- a means for providing an electric field to create a bias between ends of the capillary tube.

26. (previously presented) The apparatus of claim 13 wherein the separation apparatus comprises:

- a stacked pair of lithographically etched glass plates;
- a buffer; and,
- a means for providing an electric field to create a bias between ends of the glass plates.

27. (new) A method of sequencing DNA fragments comprising:

- placing a DNA sample within a buffer in a separation apparatus having a plurality of migration channels;
- applying an electric field across the separation apparatus to create a bias in the buffer such that the DNA sample migrates from one end of the apparatus to another end along a migration channel;
- separating the DNA sample into fragments along the migration channel within the buffer;
- illuminating the DNA fragments with an illumination source attached to a means for detecting fluorescent light emitted from the fragments;
- detecting fluorescent light emitted from the fragments along the migration channel; and,
- generating a full image of the separation apparatus and the separated DNA fragments in a single scan pass.

28. (new) An apparatus for the sequencing of DNA  
comprising:

a separation apparatus having a plurality of migration channels  
operative to receive a DNA sample and facilitate migration and separation into  
fragments of the DNA sample along a migration channel within the apparatus;

a detector operative to detect light emitted from DNA fragments  
along the migration channels; and

an illumination source attached to the detector; and

an image processor operative to generate image data  
representing a full image of the separation apparatus and the DNA fragments  
in a single scan pass.

29. (new) A method of sequencing DNA fragments  
comprising:

placing a DNA sample within a buffer in a separation apparatus  
having a plurality of migration channels;

applying an electric field across the separation apparatus to  
create a bias in the buffer such that the DNA sample migrates from one end of  
the apparatus to another end along a migration channel;

separating the DNA sample into fragments along the migration  
channel within the buffer;

detecting fluorescent light emitted from the fragments along the  
migration channel using a large area two-dimensional image sensor array  
and,

generating a full image of the separation apparatus and the  
separated DNA fragments.